

Date: Sun, 12 Sep 93 04:30:34 PDT  
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>  
Errors-To: Ham-Homebrew-Errors@UCSD.Edu  
Reply-To: Ham-Homebrew@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Homebrew Digest V93 #41  
To: Ham-Homebrew

Ham-Homebrew Digest                      Sun, 12 Sep 93                      Volume 93 : Issue    41

Today's Topics:

        Finding Motorola SMT in small quantity  
                Homebrew 2-m rig for packet?  
How does Decibel Products VHF/UHF antenna work? (2 msgs)  
Modify Heathkit SB series for 160 meters & WARC bands ?  
        Program, convert from S params -> Spice model  
                What kits would you like to see?

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>  
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

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Date: 11 Sep 1993 16:58:36 GMT  
From: news.service.uci.edu!ucivax!news.claremont.edu!elroy.jpl.nasa.gov!swrinde!  
gatech!udel!newsserv.cs.sunysb.edu!rick@network.ucsd.edu  
Subject: Finding Motorola SMT in small quantity  
To: ham-homebrew@ucsd.edu

Designing and building RF circuits is certainly a lot of fun, but it  
borders on the impossible to get modern parts in small quantity! Does  
anyone know of a source for small quantities of the Motorola MMBR901L  
(SMT version of the MRF901)? Active seems to carry some reasonable  
second choices to the MMBR901L, eg MMBR9411, but they say Moto will  
not let them break a rail to sell part in small quantity. Should I  
starting thinking Philips, Siemens, Mitsubishi (off shore) for RF  
parts, or is there a way to get Motorola in small quantities? I  
want to stay with SMT, since it is a bit of a drag to have to drill  
all the holes needed for through-hole when using home grown PCBs :-)

BTW, anyone know whether the 2N4416(A) is available in SMT?

Rick Spanbauer, WB2CFV  
State U of NY/Stony Brook

-----  
Date: Thu, 9 Sep 1993 21:49:20 GMT  
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!math.ohio-state.edu!  
hobbes.physics.uiowa.edu!news.uiowa.edu!icaen.uiowa.edu!drenze@network.ucsd.edu  
Subject: Homebrew 2-m rig for packet?  
To: ham-homebrew@ucsd.edu

I'm looking for schematics for a homebrew 2-m rig (FM, I guess) which I could use for local packet work. 2W or less is fine, as I'm not too far from a packet node (I think) and while VFO would be nice, crystal is also acceptable

-- any help? Comments from other people who have tried doing something similar? Recommendations that it might be easier to modify/look for something else to use? Anything is welcome!

Tnx es 73 de Doug N0Z??  
03W 04D 03H 50M and counting...

--  
\_\_ /| | Douglas J Renze | Charter Member, Popular Front  
'o.o' | +1 319 337 4664 | for Revolutionary Darwinism:  
=(\_\_\_)= | drenze@isca.uiowa.edu |  
U | Douglas-Renze@uiowa.edu | Evolution Now!

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Date: Fri, 10 Sep 93 22:17:26 GMT  
From: butch!rapnet!news@uunet.uu.net  
Subject: How does Decibel Products VHF/UHF antenna work?  
To: ham-homebrew@ucsd.edu

In article <aj.747684470@sage.cc.purdue.edu> aj@sage.cc.purdue.edu  
(John Dormer) writes:

>millar@nhqvax.sanders.lockheed.com (Jeffrey R. Millar) writes:

>> - top two dipoles paralleled  
>> - top pair and second pair paralleled  
>> - top half paralleled with the bottom half.

> Each pair of things which are paralleled will give you an impedance of

>  $1/((1/Xa)+(1/Xb)+\dots+(1/Xn))$  ohms

>which means that at each first branch, the impedance is

>  $1/((1/300)+(1/300))$   
> 166.666 ohms

You probably meant to say 150 ohms...but I get the point

> If you then parallel two of these, you get

>  $1/((1/166.666)+(1/166.666))$   
> 83.333 ohms

> And finally,

>  $1/((1/83.333)+(1/83.333))$   
> 41.666 ohms

> Obviously they've adjusted the dipoles to be slightly higher than 300  
>ohms impedance (you can do this; go look in an ARRL handbook) so they  
>end up with 50 ohms at the final point in the harness. You can change the  
>impedance of a folded dipole by messing with the diameters of the "inside"  
>and "outside" halves of the fold, and their distances.

> The evil part is making interconnections which are the proper  
>impedance. 50 ohms is no trouble, 100 ohm cable does exist but I've  
>only seen it in real life a couple times, 200 ohm stuff is probably  
>open wire because of the change in required conductor sizes (or really  
>BIG diameter coax), and 400 ohm is probably really weird, too. It isn't  
>impossible, though.

> The equation I used is the same one for paralleled resistances.

I understand the parallel impedance thing. My question really revolves around the selection of coax impedances and lengths. Consider a 300 ohm antenna fed with one half wavelength of 50 ohm coax. The impedance at the coax end is 300 ohms with a lot of VSWR on the half wave coax.

The antenna stacking really needs more like 3 half waves but that still results in 300 ohms at the end.

If one placed 6 300 ohm antennas in parallel, each fed with any type coax with a length of a multiple of one half wavelength, then the input impedance becomes 50 ohms.

The problem comes from the fact that the DB products antenna consists of 8 stacked dipoles not 6. I haven't figured out a simple arrangement of 50 and

75 ohm coax in a stacking harness which results in a 50 ohm input impedance.

Another factor on my mind is bandwidth. Each of the matching coax transformers has a optimum frequency and exhibits mismatch off that frequency. In general, if the VSWR in the matching section is high, the bandwidth is low.

Given all these considerations, my question still stands...how does DB Products do it?

The views expressed here are my own, not my employer's.  
Jeff Millar, WA1HCO, Lockheed Sanders 603-885-7047

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Date: Fri, 10 Sep 1993 18:07:50 GMT  
From: mentor.cc.purdue.edu!sage.cc.purdue.edu!aj@purdue.edu  
Subject: How does Decibel Products VHF/UHF antenna work?  
To: ham-homebrew@ucsd.edu

millar@nhqvax.sanders.lockheed.com (Jeffrey R. Millar) writes:

- > - top two dipoles paralleled
- > - top pair and second pair paralleled
- > - top half paralleled with the bottom half.

Each pair of things which are paralleled will give you an impedance of

$$1/((1/Xa)+(1/Xb)+...+(1/Xn)) \text{ ohms}$$

which means that at each first branch, the impedance is

$$1/((1/300)+(1/300)) \\ 166.666 \text{ ohms}$$

If you then parallel two of these, you get

$$1/((1/166.666)+(1/166.666)) \\ 83.333 \text{ ohms}$$

And finally,

$$1/((1/83.333)+(1/83.333)) \\ 41.666 \text{ ohms}$$

Obviously they've adjusted the dipoles to be slightly higher than 300 ohms impedance (you can do this; go look in an ARRL handbook) so they end up with 50 ohms at the final point in the harness. You can change the impedance of a folded dipole by messing with the diameters of the "inside" and "outside" halves of the fold, and their distances.

The evil part is making interconnections which are the proper impedance. 50 ohms is no trouble, 100 ohm cable does exist but I've only seen it in real life a couple times, 200 ohm stuff is probably open wire because of the change in required conductor sizes (or really BIG diameter coax), and 400 ohm is probably really weird, too. It isn't impossible, though.

The equation I used is the same one for paralleled resistances.

hope I helped!

: John Dormer  
: aj@sage.cc.purdue.edu

-----  
Date: Sat, 11 Sep 1993 01:19:20 GMT  
From: swrinde!elroy.jpl.nasa.gov!sdd.hp.com!col.hp.com!news.dtc.hp.com!srigenprp!  
alanb@network.ucsd.edu  
Subject: Modify Heathkit SB series for 160 meters & WARC bands ?  
To: ham-homebrew@ucsd.edu

Pete Rossi (rossi@VFL.Paramax.COM) wrote:

: I have an old Heathkit SB-400 sitting in my basement that works  
..

:	OLD BAND	becomes	NEW BAND
:	3.5	----->	1.8
:	7.0	----->	10.0
:	14.0	----->	18.0
:	21.0	----->	24.0
:	28.0	----->	28.0 (same)
:	28.5	----->	28.5 (same)
:	29.0	----->	29.0 (same)
:	29.5	----->	29.5 (same)

Sounds like you're on the right track. The plate choke may be a problem -- You probably can't just increase the number of turns to make it work on 160 because that might cause unwanted series resonances on the higher bands (24-30 MHz).

One trick I have used is to use two chokes, with one in parallel with a capacitor:

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      +---Inductor#1---+
      |                  |
-----+                  +---Inductor#2-----
      |                  |
      +---Capacitor---+

```

Inductor #2 is the original plate choke, and inductor #1 is new.  
 The capacitor parallel-resonates with inductor #1 in the 160 meter band.  
 There is a second series resonance between the capacitor and inductor #2  
 that should be placed between 160 and 80 meters. By using this  
 arrangement, you can control where the series resonance occurs,  
 and make sure it doesn't fall in a ham band.

AL N1AL

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Date: 12 Sep 1993 07:40:37 GMT
From: news.graphics.cornell.edu!newsstand.cit.cornell.edu!
newsstand.cit.cornell.edu!usenet@tcgould.tn.cornell.edu
Subject: Program, convert from S params -> Spice model
To: ham-homebrew@ucsd.edu

```

In article <26i5kj\$edp@newsserv.cs.sunysb.edu> Rick Spanbauer,  
 rick@cs.sunysb.edu writes:

You can write a simple fortran program to do the conversions.  
 See, for example, Guillermo Gonzalez, "Microwave Transistor Amplifiers,"  
 pp24-25. Prentice Hall 1984. If you expect to extract a detailed model of  
 your devices, including the effects of pad parasitics, you will also need  
 to fabricate short circuited and open circuited test structures. I'm  
 assuming here that you are doing on-wafer coplanar waveguide probing of  
 the transistors. If you do not have these test structures available your  
 model will be narrow band because you will not be able to separate the  
 effects of the intrinsic device from the contact pads.

Best Regards,

Kerry

Litvin@NNFVAX.CORNELL.EDU

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Date: Fri, 10 Sep 1993 17:42:44 GMT
From: nwnexus!ole!ssc!markz@uunet.uu.net

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Subject: What kits would you like to see?  
To: ham-homebrew@ucsd.edu

Bill White (bwhite@cobra.camb.inmet.com) wrote:  
: I asked my wife about this last night. She's a EE and an electronics  
: manufacturing engineer, though analog and RF electronics is not her  
: specialty. (She thinks I'm a lunatic for futzing around with discrete,  
: through-hole parts. She doesn't understand how anybody could even  
: think of doing something other than surface mount technology with  
: big machines and parts on reels.) She pointed out to me: If people used  
: to use these, then they were solving a problem. Either the problem  
: has gone away, or they solve it with other parts now.

How about an entire industry going away. RF parts like dual gate  
MOSFETS would be primarily used in consumer electronics and they  
don't make enough of that in the USA (anymore) for the local suppliers to  
bother making them.

Mark Zenier markz@ssc.wa.com markz@ssc.com

-----  
Date: 11 Sep 1993 04:54:14 GMT  
From: csus.edu!csulb.edu!byon@decwrl.dec.com  
To: ham-homebrew@ucsd.edu

References <40010001@opus.hpl.hp.com>, <40010002@opus.hpl.hp.com>,  
<1993Sep10.151101.6402@news.uiowa.edu>ed  
Subject : Re: Morse Keyboard replacement

In article <1993Sep10.151101.6402@news.uiowa.edu>,  
Douglas J Renze <drenze@icaen.uiowa.edu> wrote:  
>walker@opus.hpl.hp.com (Rick Walker) writes:  
>>Now add the hack that "C" prepended to any character is a control character:  
>> CA (-.-.-) "^A"  
>> ...

But then "^N" == ";"

>>These could be mapped to digraphs starting with "-.-" for <punctuation>:  
>> <punc>A (-.-.-) .  
>> <punc>B (-.-.-.-)

And <punc>A is "."

>>What I'd really like to hear from this group, though, is good algorithms  
>>for doing morse code detection in software... For instance, how do you  
>>optimally track a changing WPM rate?

See below.

>I foresee some more possible problems: First, you need to design software  
>intelligent enough to figure out that a long pause is a space between words.  
>Second, some of the peculiar spacing rules. Ie, two spaces after a colon,  
>two spaces after a period at the end of a sentence. As for shift, well...  
>following the paradigm of prepending a C to a character for a control char  
>(eg, CC for Ctrl-C) we could do SA for shift-A, etc. Only problem I can  
>see would be if we wanted to use SK for something. Or we could also do  
>UA for "uppercase-A." Near as I can remember, no prosigns, etc. begin with  
>dadadit.

except for "uppercase-A" being a ",",.

>

In regards to the software, I put a lot of energy writing a morse-code  
decoder algorithm to decode even the sloppiest of fists. It does a real  
good job too. The hardware tone decoder is the biggest problem. But  
with a trivial hardware set-up and this software, I was able to send  
200 wpm code over 10 miles on VHF. Perfect copy on a slow 286. (it  
was modulated CW actually).

I experimented with several designs for handling the changing WPM rate,  
and settled on a rather simple scheme which only needed to keep track  
on the length of the last mark. I'd be glad to go further into it.

What algorithms have others tried?

--

Byon Garabrant KD6BCH byon@csulb.edu

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Date: 10 Sep 1993 17:45:42 GMT

From: sdd.hp.com!elroy.jpl.nasa.gov!usc!howland.reston.ans.net!noc.near.net!  
bigboote.WPI.EDU!duck!jmhill@network.ucsd.edu

To: ham-homebrew@ucsd.edu

References <262keq\$ncu@bigboote.WPI.EDU>, <268isg\$62@k2.sj.ate.slb.com>,  
<CCv1zx.BC2@dma.pub.dma.org>

Subject : Re: What kits would you like to see?

Hi;

I have a few friends who say their 2 meter handy talkies have no VOX,



or auto transmit when you talk switch. Maybe a simple project that keys  
a handheld when you talk would be helpful.

Jonathan/KA1WZN

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End of Ham-Homebrew Digest V93 #41

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